

**Title: Melts in Your Mouth****Brief Overview:**

With the use of a statistical experiment involving M&M's, the student will compile information and explore the topics of mean, median, mode, standard deviation, and how they apply to the normal curve.

**Link to Standards:**

- **Problem Solving** Students will use problem solving to investigate distribution of data.
- **Communication** Students will work cooperatively to collect data and analyze their results.
- **Statistics** Students will collect and organize data in table form. They will also calculate standard deviation and apply it to the normal curve.

**Grade/Level:**

Grades 9 - 12

**Duration/Length:**

This activity will take 1 to 3 days, depending on class duration.

**Prerequisite Knowledge:**

Students should have working knowledge of the following:

- Mean, median, mode
- Variance and standard deviation
- Normal curve

**Objectives:**

Students will be able to:

- work cooperatively in groups.
- collect and organize data.
- analyze data with respect to measures of central tendencies and dispersions.

**Materials/Resources/Printed Materials:**

- Packets of M&M's
- Student worksheets
- TI-82 graphics calculator

**Development/Procedures:**

- Group students (optimal size of 6).
- Distribute a packet of M&M's to each student, and assign colors.
- Sort each packet of M&M's according to colors.
- Gather totals of each packet of the student's assigned colors, within their group.
- Compute mean, median, and mode of the individual colors.
- Complete table to facilitate the computation of variance and standard deviation.
- Gather class totals of students colors, repeat calculations, and analyze.
- Explore the statistical capabilities of the TI - 82 graphics calculator with respect to the above activity.

**Evaluation:**

The teacher will circulate among the groups to ensure that they are on task. Evaluation will be based upon performance, time on task, quality of discussion, and completion of project.

**Extension/Follow Up:**

- Reinforcement of statistical concepts and the use of the TI - 82 graphics calculator through additional worksheets
- Discussion of quality control

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# "MELTS IN YOUR MOUTH"

## Standard Deviation and the Normal Curve

Name \_\_\_\_\_

Group \_\_\_\_\_

Period \_\_\_\_\_ Date \_\_\_\_\_

Color(s) \_\_\_\_\_

### DATA COLLECTION:

Sort packet of M&M's into colors and record frequencies in the table below.

RED	ORANGE	YELLOW	GREEN	BLUE	BROWN

### SHARED GROUP DATA:

Network with members of your group to compile data for the color(s) for which you are responsible and calculate the mean, median, and mode.

	mean median mode								
RED									
ORANGE									
YELLOW									
GREEN									
BLUE									
BROWN									

### STANDARD DEVIATION OF GROUP DATA:

Complete the following table to find the variance and standard deviation for your color(s).

sample	$x_i$	$\bar{x}$	$\bar{x} - x_i$	$(\bar{x} - x_i)^2$
1				
2				
3				
4				
5				
6				

Sum \_\_\_\_\_

- variance = \_\_\_\_\_
- standard deviation = \_\_\_\_\_

CLASS DATA:

Network with members of the class to compile data for the color(s) for which you are responsible. Calculate the mean, median, mode, variance, and standard deviation.

[illegible]

sample	$x_i$	$\bar{x}$	$\bar{x} - x_i$	$(\bar{x} - x_i)^2$
1				
2				
3				
4				
5				
6				

Sum \_\_\_\_\_

- variance = \_\_\_\_\_
- standard deviation = \_\_\_\_\_

#### ANALYSIS:

- 1) From your group data, what predictions would you make about the general population? Explain.
- 2) Did the conclusions support your predictions for the general population study drawn from your small group study (sample)? Explain.
- 3) Did your population study relate to the normal distribution curve? Explain and illustrate.

EXPLORE STATISTICAL CAPABILITIES OF THE TI - 82 GRAPHICS CALCULATOR. ( Instructed Use )

“MELTS IN YOUR MOUTH”  
Supplemental Worksheet

Name \_\_\_\_\_

Group \_\_\_\_\_

Period \_\_\_\_\_ Date \_\_\_\_\_

Color(s) \_\_\_\_\_

DATA COLLECTION:

Compute the percentage of each color for your individual packet of M&M's.

RED	ORANGE	YELLOW	GREEN	BLUE	BROWN

SHARED GROUP DATA:

Compute the percentage of each color for your group.

RED	ORANGE	YELLOW	GREEN	BLUE	BROWN

CLASS DATA:

Compute the percentage of each color for the class.

RED	ORANGE	YELLOW	GREEN	BLUE	BROWN

### **NOTES TO TEACHER:**

- 1) On June 27,1996, the M&M/Mars Division of Mars Inc. distributed their non-seasonal M&M colors as follows:

30% : Brown

20% : Yellow, Red

10% : Orange, Green, Blue

Source: M&M/Mars  
Division of Mars Inc.  
Hackettstown, NJ 07840 - 1503  
1-800-627-7852

- 2) **At the conclusion of this unit, the students may eat their data!!!!**